



U.S. Department of Energy
Office of River Protection

P.O. Box 450
Richland, Washington 99352

02-OSR-0382

Mr. R. F. Naventi, Project Manager
Bechtel National, Inc.
3000 George Washington Way
Richland, Washington 99352

Dear Mr. Naventi:

CONTRACT NO. DE-AC27-01RV14136 – APPROVAL OF BECHTEL NATIONAL, INC. (BNI)
AUTHORIZATION BASIS CHANGE NOTICE (ABCN) 24590-WTP-ABCN-ESH-02-012, REVISION
0

Reference: BNI letter from A. R. Veirup to M. K. Barrett, ORP, "Transmittal for Approval – Authorization
Basis Change Notice 24590-WTP-ABCN-ESH-02-012, Revision 0, *Types of Building
Construction – Fire Resistance Ratings*," CCN-033566, dated June 17, 2002.

The U. S. Department of Energy, Office of River Protection has reviewed the ABCN submitted in the
Reference letter. The proposed changes to the Safety Requirements Document and Initial Safety Analysis
Report Fundamental Aspects of Design, to achieve consistency in the implementing standard for the fire resistive
design and construction of the Waste Treatment Plant (WTP), are acceptable.

There is reasonable assurance that the authorization basis changes do not adversely affect the health and safety
of the public or workers, are consistent with applicable laws, regulations, and WTP contractual requirements,
and do not introduce inconsistencies with Top-Level Standards or conflict with other authorization basis
requirements. Attached is the Safety Evaluation Report.

If you have any questions, please contact me, or your staff may contact L. F. Miller, Jr., Office of Safety
Regulation, (509) 376-6817.

Sincerely

OSR:RWG

Roy J. Schepens
Manager

Attachment

**Safety Evaluation Report (SER)
of Proposed Authorization Basis Change Notice
24590-WTP-ABCN-ESH-02-012, Revision 0
for the River Protection Project – Waste Treatment Plant (RPP-WTP)**

1.0 INTRODUCTION

Bechtel National, Inc. (BNI) is the Contractor for the RPP-WTP under Contract No. DE-AC27-01RV14136 between the U. S. Department of Energy (DOE) and BNI. The RPP-WTP authorization basis (AB) is the composite of information, provided by the Contractor in response to radiological, nuclear, and process safety requirements, that is the basis on which the Office of River Protection Manager grants permission to perform regulated activities. The AB includes that information requested by the Contractor for inclusion in the AB and subsequently accepted by the U.S. Department of Energy (DOE). The AB for the RPP-WTP includes the Safety Requirements Document (SRD)¹ and the fundamental aspects of design as contained in the Initial Safety Analysis Report (ISAR)². The SRD provides the Contractor-derived and DOE-approved radiological, nuclear, and process safety objectives and criteria applicable to the design, construction, acceptance testing, maintenance, operation, and deactivation and decommissioning of the RPP-WTP. Section 4.5 of the SRD contains the safety criteria for fire protection, including associated implementing codes and standards. An implementing standard for all of the SRD fire protection safety criteria is DOE G 420.1 and DOE G 440.1.³ SRD Appendix C, Section 4.0 addresses tailoring of DOE G 420.1 and DOE G 440.1 for the RPP-WTP. Included in this tailoring is a clarification to DOE G 420.1 and DOE G 440.1, Section III.5.0, to add the following: "The applicable building code for the RPP-WTP Project is the 1997 Uniform Building Code (UBC)." Volume II of the ISAR provides the fundamental aspects of design which are the only parts of the ISAR considered to be part of the RPP-WTP authorization basis. ISAR Volume II, Section 8.3 addresses fire protection features and systems that are considered to be Fundamental Aspects of Design.

2.0 BACKGROUND

ABCN 24590-WTP-ABCN-ESH-02-012, Revision 0, was reviewed against the Office of Safety Regulation Management Directive 3.4, "Processing Authorization Basis Amendment Requests,"⁴ to ensure that:

- Changes to the AB (SRD and ISAR Fundamental Aspects of Design) did not adversely affect the health and safety of the public or workers

¹ BNI Document 24590-WTP-ESH-SRD-01-001-02, *Safety Requirements Document*, Volume II, Revision 1, dated June 6, 2002.

² BNI Document 24590-WTP-ESH-ISAR-01-001-02, *Initial Safety Analysis Report*, Volume II, Revision 1, dated September 21, 2001.

³ DOE G-420.1/G-440.1, *Implementation Guide for Use with DOE Orders 420.1 and 440.1, Fire Safety Program*, dated September 30, 1995.

⁴ RL/REG-97-05, Office of Safety Regulation Management Directive 3.4, *Processing Authorization Basis Amendment Requests*, Revision 1, dated January 25, 2001.

- Changes to the AB (SRD and ISAR Fundamental Aspects of Design) were consistent with applicable laws, regulations, and RPP-WTP contractual requirements
- Changes to the AB (SRD and ISAR Fundamental Aspects of Design) did not introduce inconsistencies with Top-Level Standards or conflict with other AB documents.

This SER documents the results of the review of ABCN 24590-WTP-ABCN-ESH-02-012, Revision 0, including the associated proposed revisions to the SRD and ISAR Fundamental Aspects of Design.

3.0 EVALUATION

The proposed change to the SRD is to revise Appendix C, "Implementing Standards," Section 6.0, "NFPA 801, Standard for Facilities Handling Radioactive Materials," to include tailoring of NFPA 801, Section 3-5 to replace "Type I or Type II in accordance with NFPA 220, Standard on Types of Building Construction," with "Fire resistive in accordance with the 1997 edition of the Uniform Building Code [UBC])." The justification provided by BNI for this change in the SRD is that the applicable building code for the RPP-WTP Project is the 1997 UBC. The UBC specifies building requirements for fire resistance, allowable floor area, building height limitations, and building separation.

The proposed change to the ISAR, Volume II, Section 8.3, "Fire Protection Features and Systems," is to revise the text from "The process building is designed and constructed of noncombustible or limited combustible materials and complies with the standards of Type I construction as defined in NFPA 220, *Standard Types of Building Construction*," to "The process building is designed and constructed of noncombustible or limited combustible materials."

The previous RPP-WTP Contractor (BNFL, Inc.) submitted six authorization basis amendment requests (ABARs) to DOE in April 2000.⁵ One of the ABARs, ABAR-W375-00-00012,⁶ proposed significant tailoring to the fire protection implementing codes and standards associated with the safety criteria in Section 4.5 of the SRD. DOE provided partial approval⁷ of the ABAR in July 2000, including a change to SRD Appendix C, Section 4.0, DOE G-420.1 and DOE G 440.1, "Implementation Guide for Use with DOE O 420.1 and DOE O 440.1, Fire Safety Program," to add the following: "The applicable building code for the RPP-WTP Project is the 1997 Uniform Building Code (UBC)." This change was approved because it provided clarification and specificity to the DOE G 420.1 and DOE G 440.1 guidance: "DOE facilities and sites should meet the applicable building code and National Fire Protection Association

⁵ BNFL letter from A. J. Dobson to D. C. Gibbs, REG, "Transmittal of Authorization Basis Amendment Requests," CCN: 012921, dated April 24, 2000.

⁶ Authorization Basis Amendment Request, ABAR-W375-00-00012, Revision 0, *Tailor SRD Fire Safety Criteria and Associated Implementing Standards*

⁷ REG letter from D. C. Gibbs to P. O. Strawbridge, BNFL, "Regulatory Unit (RU) Partial Approval of ABAR-W375-00-00012, Tailor SRD Fire Safety Criteria and Associated Implementing Standards," 00-RU-0500, dated July 27, 2000.

(NFPA) Codes and Standards, unless explicit written relief has been granted by DOE." As such, the 1997 UBC became and remains the applicable building code of record for the RPP-WTP. Approval of ABAR-W375-00-00012 created an inconsistency within the project authorization basis. Specifically, SRD Section 4.5 safety criteria implementing standard NFPA 801, Section 3-5, "Construction," requires "Buildings in which radioactive materials are to be used, handled, or stored shall be fire resistive or noncombustible (Type I or Type II in accordance with NFPA 220, Standard on Types of Building Construction)." However, the UBC (1997) also contains requirements for building fire resistance and associated ratings/types, allowable floor area, building height limitations, and building separation. In addition, ISAR Volume II, Section 8.3, "Fire Protection Features and Systems," stated: "The process building is designed and constructed of noncombustible or limited combustible materials and complies with the standards of Type I construction as defined in NFPA 220, Standard Types of Building Construction." The purpose of 24590-WTP-ABCN-ESH-02-012 is to resolve these inconsistencies.

The common linkage through the authorization basis documents discussed above is the requirement that the process buildings be designed and constructed of "fire resistive, noncombustible, or limited combustible materials." The changes proposed by 24590-WTP-ABCN-ESH-02-012 retain this requirement; as such, there is no reduction in the fire safety for these buildings relative to the requirements imposed on their materials of construction. Accordingly, the changes proposed by 24590-WTP-ABCN-ESH-02-012 are not considered to represent a reduction in commitment relative to the fire safety requirements in the existing authorization basis.

NFPA 220 defines types of building construction based on the combustibility and the fire resistance rating of a building's structural elements. Fire walls, nonbearing exterior walls, nonbearing interior partitions, fire barrier walls, shaft enclosures, and openings in walls, partitions, floors, and roofs are specifically excluded from its scope. However, the UBC (1997) does not exclude these structural elements from its scope and, in addition to defining types of construction based on fire-resistive requirements, includes limits on allowable floor area, building height limitations, and building separation requirements based on the type of construction and proposed occupancies for the building (e.g., business, factory/industrial, hazardous, storage, etc.). Thus, in addition to being the project building code of record, the UBC provides more complete and exhaustive requirements to ensure that acceptable fire safety considerations are reflected in the building design and materials of construction.

As discussed above, BNI, and BNFL, Inc. previously, has been evolving the designs for the Low Activity Waste, High Level Waste, and Pretreatment buildings on the basis of compliance with the requirements of the UBC (1997). Thus, there is no justification for or benefit to the government from maintaining references to the requirements of NFPA 220 within the RPP-WTP authorization basis.

4.0 CONCLUSIONS

The reviewers determined that the SRD and ISAR Fundamental Aspects of Design changes proposed by ABCN 24590-WTP-ABCN-ESH-02-012, Revision 0, appropriately correct inconsistencies within the RPP-WTP AB. Further, the proposed changes maintain the commitment to the fire resistive or noncombustible design and construction of the RPP-WTP process buildings. Lastly, the proposed changes are consistent with the previously DOE-approved identification of the UBC (1997) as the building code of record for the RPP-WTP. Therefore, ABCN 24590-WTP-ABCN-ESH-02-012, Revision 0, and the associated revisions to the SRD and ISAR Fundamental Aspects of Design, are approved.